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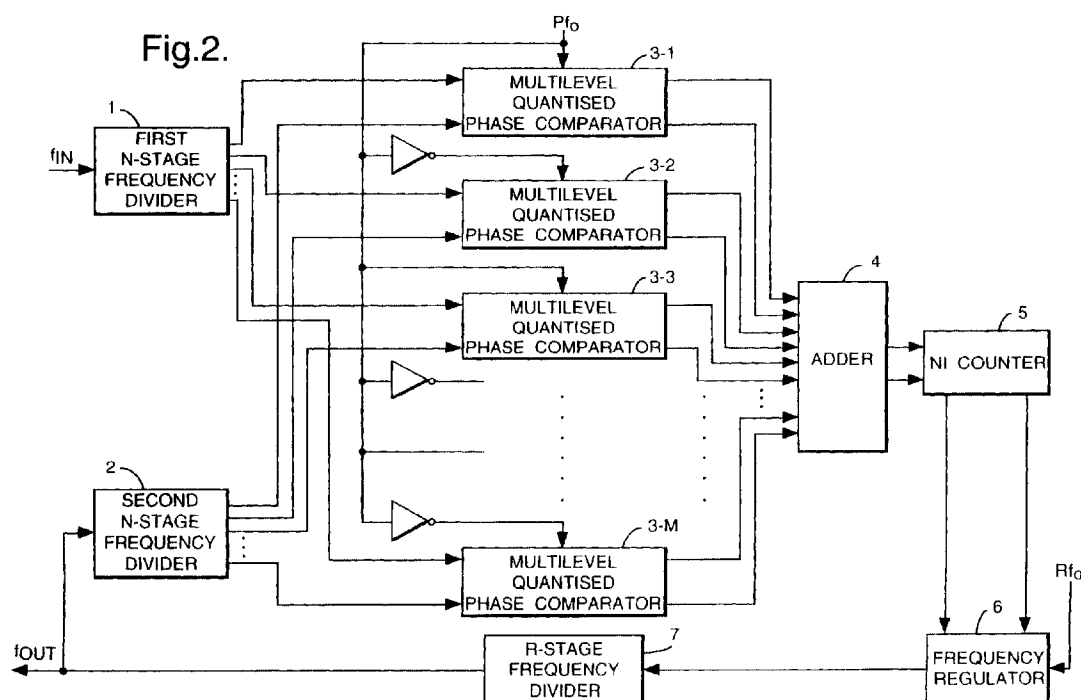
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(54) Digital phase-locked loop

(57) Using positive-phase or negative-phase clocks of phase count clock Pf_0 , a number M of multilevel quantized phase comparators output as values quantized in multiple levels the phase differences of output signals outputted from first and second N -stage frequency dividers wherein input clocks and output clocks, respectively, of a digital PLL have been N -stage frequency divided and moreover, divided into M groups. An adder

adds this phase difference information and outputs advanced pulses or delayed pulses. An $N1$ counter counts up in response to advanced pulses and both outputs an increment pulse and undergoes setting to initial value $N1$ upon counting up to $2N1$. In response to delayed pulses, the $N1$ counter counts down, and upon counting down to "0" both outputs a decrement pulse and undergoes setting to initial value $N1$.



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EUROPEAN SEARCH REPORT

Application Number
EP 96 30 2922

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	YOSHINORI ROKUGO ET AL: "A DIGITAL PHASE-LOCKED LOOP FOR STUFFING SYNCHRONIZATION SYSTEMS" ELECTRONICS & COMMUNICATIONS IN JAPAN, PART I - COMMUNICATIONS., vol. 75, no. 4, 1 April 1992, NEW YORK US, pages 1-12, XP000307927 * page 1, column 1, line 1 - page 3, column 2, last line; figure 1 *	1-4	H03L7/191 H03L7/087
A	EP 0 526 227 A (NIPPON ELECTRIC CO) * column 1, last line - column 2, line 7 * * column 5, line 19 - column 7, line 34; figures 7-11 *	1-4	
A	TOKUNAGA M ET AL: "DIGITAL NEURON MODEL WITH DPLL FOR ASSOCIATIVE MEMORY" PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM ON CIRCUITS AND SYSTEMS, NEW ORLEANS, MAY 1 - 3, 1990, vol. 2 OF 4, 1 May 1990, INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, pages 1069-1072, XP000167001 * abstract; figure 1 *	1-4	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			H03L
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 17 February 1998	Examiner Balbinot, H
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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